



THE McEDWARDS GROUP

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EXHIBIT 1

RESUME

DONALD G. McEDWARDS

Principal Hydrogeologist

EXPERIENCE SUMMARY

Dr. McEdwards has extensive experience in groundwater supply and groundwater quality investigations including site characterizations, water supply well siting, monitoring well design and installation, aquifer characterization, groundwater flow and contaminant transport modeling, and design and permitting of site remediation programs. He has managed projects involving assessing the extent of contamination; remediating soil and groundwater contamination by excavation, soil vacuum extraction, air sparging, oxygen infusion, bioremediation; verification monitoring; and site closure. He also has experience in surface water hydrology investigations, design of drainage facilities, mitigation of debris flow damage, and cost allocation of multi-source contaminant plumes. He has provided expertise in support of attorneys involved in litigating soil and groundwater contamination issues.

EDUCATION

University of California, Berkeley

Ph.D., Engineering Science, 1979

M.S., Engineering Science, 1973

California State University, Northridge

B.S., Geology, 1972

REGISTRATION & LICENSES (California)

Registered Geologist No. 3872

Certified Engineering Geologist No. 1208

Registered Civil Engineer No. 28088

Certified Hydrogeologist No. 153

Class A General Engineering Contractor (#743428)

Hazardous Materials Certification

Asbestos Abatement Certification

HAZARDOUS WASTE TRAINING

Forty-hour course following EPA requirements. Included training in physical, chemical, and toxicological properties of hazardous materials; hazard evaluation and control; selection and use of personal protective equipment, including self-contained breathing apparatus and fully encapsulating suits; sampling and monitoring techniques and equipment; and site entrance and decontamination procedures.

EXPERIENCE

1995 - Present

The McEdwards Group, Willits, CA

Principal Hydrogeologist

1988 - 1995

Trans Tech Consultants, Santa Rosa, CA

Principal Hydrogeologist

Donald G. McEdwards - Resume

Exhibit 1

1985 - 1987	Geohydrologic Services, Petaluma, CA Principal Engineer/Geologist
1984 - 1985	TERA Corporation, Berkeley, CA Senior Project Hydrogeologist
1979 - 1984	Harding Lawson & Associates, Novato, CA Associate Engineer
1977 - 1979	Lawrence Berkeley Laboratory, Earth Sciences Division Berkeley, CA Staff Scientist II
1975 - 1977	Lee and Praszker, San Francisco, CA Senior Engineering Aide, University of California and Staff Engineer

REPRESENTATIVE PROJECTS

2260 ORDINANCE ROAD - Santa Rosa, CA

Installed six monitoring well to define the extent of gasoline and diesel contamination. Conducted well tests using the wells and found the shallow aquifer to be moderately permeable and amenable to biodegradation. Using the well test data and proprietary computer programs, the flow rates, groundwater flow lines, and capture areas were calculated for an in-situ bioremediation program. Developed a remediation plan to extract clean water from perimeter wells, amend the water with nutrients and oxygen to promote bacterial growth, and inject the water into the tank excavation where the fuel leak occurred. The system was operated for a period of seven months, during which time the concentration of contaminants decreased from free floating product to laboratory reporting limits.

5580 ST. HELENA ROAD - Santa Rosa, Ca

Directed excavation of a septic tank contaminated with diesel fuel (delivery of diesel was made directly into the septic tank). Directed bioremediation of the tank contents to allow disposal as conventional septage. Managed investigation to determine extent of diesel contamination. Prepared and implemented an insitu bioremediation plan involving circulating amended water through the zone of contamination in a closed loop between injection and extraction trenches.

128 KENTUCKY STREET - Petaluma, CA

Managed excavation of diesel contaminated soil to 14 feet deep in area bounded an historic three-story building, a city vehicular right of way, a four-story building, and a pedestrian alley. To support the adjacent buildings and pavement, a series of cast-in-place concrete piles with cross bracing were installed on the perimeter of the excavation area. Oversaw preparation of structural drawings, obtained the necessary building permits, prepared contractor bid specifications, oversaw work of the excavation contractor, and arranged for disposal of excavated soil. Confirmation samples indicated that all contaminated soil was removed.

Harris Quarry, Willits, CA

Designed retention structure to accommodate storm water from a 20 year, 1 hour precipitation event for a hard rock quarry in Willits. Made use of the Intensity, Duration, and Frequency Curve Programs provided by the Office of Project Planning and Design, Department of Transportation, State of California. Represented quarry owners before the Sonoma County Planning Commission. Quarry permit to operate was approved.

GROUNDWATER CONTAMINATION STUDY - Livermore, CA

Assisted in the interpretation of hydrologic and chemical data from over 130 wells completed to depths ranging from 70 to 140 feet. Directed and analyzed well tests for newly installed wells. Directed abandonment of water supply wells that were cross-contaminating several aquifers.

SURFACE WATER RUNOFF AND DEBRIS FLOW CHARACTERIZATION - San Rafael, CA

Evaluated probable frequency and volumes of debris flows and developed 100 year, 24 hour storm runoff for sizing debris catch basins for a residential development. Compared Soil Conservation Service Method with Rational Method and compared rain fall intensity data developed by USGS with rain fall intensity data used by CALTRANS.

PCB CONTAMINATION/GROUND WATER STUDY - Cloverdale, CA

Defined site stratigraphy and hydrogeology by installing borings and monitoring wells, conducting and interpreting pump tests and slug tests, and measuring groundwater levels. Characterized groundwater flow and contaminant migration. Prepared remedial action plan for submission to the California Regional Water Quality Control Board.

REMEDIAL ACTION DESIGN - Sonoma County, CA

Remedial Action Design, Sonoma County California. Developed flow model to calculate extraction well sweep areas for choosing optimum well placement and pumping rates for contaminated water removal at a wood treatment plant.

NUMERICAL SIMULATION STUDY - Santa Clara County, CA

Evaluated alternative groundwater extraction schemes and wrote final report for removal of chemical-laden ground water at a large industrial site in San Jose. The study involved simulating groundwater flow and chemical transport within a large groundwater basin and providing quantitative comparisons of alternative extraction schemes.

GROUNDWATER PROTECTION PLAN - Santa Clara County, CA

Defined stratigraphy and hydrogeology of site by installing monitoring wells, geophysically logging test borings and wells, conducting aquifer tests, and interpreting aquifer tests.

REMEDIAL ACTION MODELING/EXTRACTION WELL DESIGN - Point Molate, CA

Developed steady state model of groundwater flow around various structures for use in designing an extraction well system for petroleum-contaminated ground water at a U.S. Navy Fuel Depot.

AQUIFER CHARACTERIZATION - Bethel, AK

Managed field demonstration and wrote aquifer characterization plan for aquifer thermal energy storage demonstration project. Designed wells and well field, pressure and temperature instrumentation, well logging and well testing program, and laboratory testing program.

WATER RESOURCES STUDY, WATER RESOURCES DEPARTMENT - Diego Garcia

Analyzed precipitation data, soil hydraulic conductivity, and depth to fresh water-sea water mixing zone to recommend safe yield flow rate for wells supplying water for fire protection.

GROUND WATER RESOURCES DEVELOPMENT - Bridgeport, CA

Sited, logged, and pump-tested exploratory water well for U.S. Marine Corps Training Camp.

GEOHERMAL WELL PRODUCTION AND INTERFERENCE TESTING - Imperial Valley, CA

Analyzed observation well pressure changes caused by several production wells flowing at various rates. Determined global values of aquifer transmissivity and storativity.

CITY WATER WELL SITING - Rio Vista, CA

Conducted well interference tests on three city wells to locate a new city water well.

IT BENICIA LANDFILL E.I.R. - Benicia, CA

Developed analytical precipitation-groundwater discharge balance model to estimate the effective permeability of the native soils.

GROUNDWATER CONTROL SYSTEM - Bakersfield, CA

Designed groundwater control system drainage blanket for drilling waste landfill.

GEOLOGICAL HAZARDS STUDY - Contra Costa County, CA

Conducted geological hazards study and capacity analysis for proposal sanitary landfill.

WELL TEST PROGRAM - Russian River, CA

Designed well test program to determine effective yield of proposed water supply wells sited in the channel.

EAST MESA GEOTHERMAL FIELD - Imperial Valley, CA

Conducted and analyzed several well production and interference tests at the field.

STRIPA MINE - Stora, Sweden

In support of nuclear storage studies, designed and assembled uphole instrumentation system to measure flow rate and pressures of double packer borehole injection tests in fractured granite.

Miscellaneous Projects

Wrote multiple-well variable-flow-rate well test analysis programs ANALYZE and PANAL. ANALYZE treats completely penetrating wells in isotropic confined aquifer; PANAL treats partially completed or limited-entry wells in anisotropic confined aquifer.

Conducted numerous fuel release site investigations and remediations involving drilling test borings, and installing, developing, and sampling monitoring wells.

Analyzed hydrologic well test data and wrote User's Guides to two computer programs: A well test analysis program (ANALYZE) and a two-phase geothermal reservoir simulation program (SHAFT 79).

Reviewed International Atomic Energy Commission draft document SG-S7 entitled "Nuclear Power Plant Siting - Hydrogeological Aspects" and provided extensive corrections and comments.

PUBLICATIONS

- 1976 Results of interference tests from two geothermal reservoirs. LBL-4484, SPE-6052, August 1976 (with T. N. Narasimhan and P. A. Witherspoon).
- 1976 Analysis of well tests with variable discharge. Presented at Geothermal Reservoir Engineering Workshop, Stanford University, Stanford, California, December 1976 (with C. F. Tsang).
- 1977 Results of reservoir evaluation tests, 1976 East Mesa Geothermal Field, California. LBL-6364, July 1977 (with T. N. Narasimhan).
- 1977 Variable flow well test analysis by a computer assisted matching procedure. LBL-5994, SPE-6547, April 1977 (with C. F. Tsang, T. N. Narasimhan, and P. A. Witherspoon).

- 1977 Variable-rate multiple-well testing analysis. LBL-7027, Proc., Invitational Well Test Symposium, October 19-21, 1977, Berkeley, California (with C. F. Tsang).
- 1977 Recent results from tests on the Republic geothermal wells, East Mesa, California. LBL-7017, December 1977 (with T. N. Narasimhan, R. C. Schroeder, C. G. Goranson, D. A. Campbell, and J. H. Barkman).
- 1978 Results of two injection tests at the East Mesa KGRA. Proc., Second Invitational Well Test Symposium, 1978, Berkeley, California (with S. Benson).
- 1978 Geothermal resource and reservoir investigations of U.S. Bureau of Reclamation leaseholds at East Mesa, Imperial Valley, California. LBL-7094, October 1978 (Section 3 and Appendixes A, B, and C, with S. Benson).
- 1979 Multiwell variable rate well test analysis. Ph.D. dissertation, University of California, Berkeley, California.
- 1979 Multiwell variable rate well test analysis. SPE-8293, presented at the 54th Annual Conference in Las Vegas, Nevada, September 23-26, 1979.
- 1979 Multiple well variable rate well test analysis of data from the Auburn Thermal Energy Storage Program. LBL-10194, November 1979.
- 1981 User's Manual for ANALYZE - A variable-rate multiple-well least squares matching routine for well test analysis. LBL-10907, July 1981 (with S. Benson).
- 1984 Quantitative Comparison of Simulated Aquifer Restoration Schemes. Proc., National Water Well Association Conference on Practical Applications of Ground Water Models, August 15-17, 1984, Columbus, Ohio.
- 1988- Computer programs CAPTURE, MATCH2, and MATCH3.
1991

CAPTURE - Plots flow paths and travel times of groundwater particles to display the areal extent of groundwater capture at specified times.

MATCH2 - Performs a least-squares fit of observed and calculated water level elevations to find values of aquifer permeability, thickness, and storage, and the elevation, gradient, and flow direction of the prepumping piezometric surface.

MATCH3 - Performs a least-squares fit of observed and calculated chemical concentrations to find values of aquifer dispersivities, chemical source concentration and dimensions, and groundwater velocity.